low ash content" (paragraph 0001), or 0.01 to 1 wt.% (abstract). In the Table in Paragraph 0065 of the Japanese language text – attached (compare with the nearly identical table in US 6,569,818*, col. 13, also attached), the actually exemplified amounts of sulfated ash are 0.6 or 0.65 weight percent (and 1.7 or 1.8 percent for comparative materials). There is thus no teaching in Nakazato that one should select from among all the optional auxiliary additives in paragraph 0039 an olefin sulfide and choose to use it in a formulation having a sulfated ash level of 0.8 to 1.2 percent.

We present herewith an additional Declaration from Ms. Carrick in which she reports her testing and comparison of the effect of sulfurized olefin (compared to oleyl amide) in both low ash (about 0.6%) and relatively high ash (about 1%) formulations. The results of the wear testing are summarized in the table, below:

HFRR Wear Scar, μm

	0.5% sulfurized olefin	0.5% oleyl amide
Low Ash (0.56 %)	143 μm	155 μm
Higher Ash (1.04 ~1.06%)	**136 μm**	210 μm

In low ash formulations, as in Nakazato, use of sulfurized olefin provides at most a slight improvement in wear compared to oleyl amide, another material taught by Nakazato. However, in the 1% ash formulations, the sulfurized olefin performs distinctively better than the oleyl amide, reducing the wear scar by 35%.

Alternatively, looking at the formulations in the presence of the oleyl amide (and thus the absence of the sulfurized olefin), going from the low ash formulation, characteristic of Nakazato, to a higher ash formulation leads to a distinctive worsening of wear. However, when the sulfurized olefin is used, the wear actually is slightly improved by going to this higher ash level.

Thus, the combination of ash level within the present range and the presence of sulfurized olefin leads to the best wear performance within the matrix. There is nothing in the teachings of Nakazato that would lead one to expect this result.

Moreover, there is nothing in the teachings of Nakazato that would lead one to select the sulfurized olefins, as required by the present invention, nor to expect that they would provide significantly better oxidation and wear performance than any of the other optional components suggested by the reference, as was demonstrated in the previous Declaration from Ms. Carrick.

* The Examiner may wish to refer to this US document (or its earlier publication US 2002/0019320, Feb 14, 2002), which appears to be an equivalent of the JP reference, each claiming priority from JP 2000-166774.

Accordingly, it is respectfully submitted that the present claims are unobvious in view of Nakazato.

Additional references were cited in combination with the main Japanese reference, against certain of the dependent claims. These references were discussed in the previous Response. That is, Claims 6, 7, 12, 21, and 22 were rejected over the JP reference, further in view of Gatto (US 5,840,672). These claims specify certain specific types of sulfurized olefins, types of detergents, or amounts of the sulfurized olefins. Gatto is said to disclose certain types of sulfurized olefins. Claim 8 was rejected over the JP reference, further in view of Boffa et al. (US 5,804,543). Claim 8 specifies an amount of zinc dialkyldithiophosphate. Boffa is said to disclose low levels of ZDDP. Claim 20 was rejected over the JP reference, further in view of Igarashi et al (US 5,912,212). Claim 20 specifies a type of hindered phenolic ester antioxidant, which is said to be disclosed in Igarashi.

However, none of these secondary references supply the teachings missing from the Japanese reference, namely, the selection of a sulfurized olefin in combination with a lubricant composition having the present specifications, notably, sulfated ash within the specified range. Neither is there any disclosure or suggestion that making this selection would lead to the improvements in wear and antioxidation performance that have been demonstrated in the Declarations of Ms. Carrick. Accordingly, each of the dependent claims, being narrower than claim 1, are likewise unobvious for the same reasons as is claim 1.

A copy of the complete Japanese document JP 2002-053888 is enclosed for the Examiner's convenience.

Conclusion.

For the foregoing reasons it is submitted that the present claims are unobvious and in condition for allowance. The foregoing remarks are believed to be a full and complete response to the outstanding office action. Therefore an early and favorable reconsideration is respectfully requested. If the Examiner believes that only minor issues remain to be resolved, a telephone call to the Undersigned is suggested.

Any required fees or any deficiency or overpayment in fees should be charged or credited to deposit account 12-2275 (The Lubrizol Corporation).

Respectfully submitted,

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Table from paragraph 0065, Nakazato, JP 2002-053888:

［評価試験結果］

試験用潤滑油	硫酸灰分 (wt.%)	リン含量 (wt.%)	硫黄含量 (wt.%)	塩素含量 (ppm)	石鹸分 (wt.%)	テスト評点 290℃	300℃
実施例1	0.6	0.03	0.08	<5	2.5	8.5	4.5
実施例2	0.6	0.03	0.07	<5	0.7	7.0	3.5
実施例3	0.6	0.03	0.07	<5	0.4	7.0	6.0
実施例4	0.6	0.03	0.08	<5	2.3	8.5	5.5
実施例5	0.6	0.03	0.25	40	2.9	7.5	6.5
実施例6	0.6	0.03	0.09	<5	0.2	6.5	5.5
実施例7	0.6	0.03	0.08	<5	2.4	8.5	6.0
実施例8	0.6	0.03	0.11	<5	2.3	8.5	5.5
実施例9	0.6	0.03	0.10	10	2.5	8.5	6.0
実施例10	0.6	0.03	0.08	<5	2.5	8.5	6.0
実施例11	0.65	0.03	0.08	<5	2.5	9.0	8.5
実施例12	0.65	0.03	0.08	<5	2.5	8.0	7.0
比較例1	0.6	0.03	0.09	<5	0.1	5.5	3.0
参考例1	1.8	0.12	0.65	20	2.6	7.0	6.0
参考例2	1.8	0.12	0.62	20	2.2	6.5	6.5
参考例3	1.7	0.11	0.54	120	--	7.5	6.0

Table from col. 13 of US Patent 5,659,818 (Nakazato et al.)

TABLE

Example No.	Ash (wt. %)	P (wt. %)	S (wt. %)	Cl (ppm)	Soap (wt. %)	Hot Tube Test 290° C.	300° C.
Ex. 1	0.6	0.03	0.08	<5	2.5	8.5	4.5
Ex. 2	0.6	0.03	0.07	<5	0.7	7.0	3.5
Ex. 3	0.6	0.03	0.07	<5	0.4	7.0	6.0
Ex. 4	0.6	0.03	0.08	<5	2.3	8.5	5.5
Ex. 5	0.6	0.03	0.08	<5	2.4	8.5	6.0
Ex. 6	0.6	0.03	0.11	<5	2.3	8.5	5.5
Ex. 7	0.6	0.03	0.10	10	2.5	8.5	6.0
Ex. 8	0.6	0.03	0.08	<5	2.5	8.5	6.0
Ex. 9	0.65	0.03	0.08	<5	2.5	9.0	8.5
Ex. 10	0.65	0.03	0.08	<5	2.5	8.0	7.0
Com. A	0.6	0.03	0.08	<5	0.1	5.5	3.0
Com. B	1.8	0.12	0.65	20	2.6	7.0	6.0
Com. C	1.8	0.12	0.62	20	2.2	6.5	6.5
Com. D	1.7	0.11	0.54	120	—	7.5	6.0